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Differences in dreams in a bilingual college population

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DIFFERENCES IN DREAMS

IN A BILINGUAL COLLEGE POPULATION

A Thesis

Presented to

the Faculty of the Department of Psychology

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Cesar Garcia

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APPROVED FOR THE DEPARTMENT OF PSYCHOLOGY

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ABSTRACT

DIFFERENCES IN DREAMS IN A BILINGUAL COLLEGE POPULATION

by Cesar Garcia

Despite its prevalence in our society, bilingualism has scarcely been addressed in the extensive research on dreaming. This investigation was focused on exploring the relationship of bilingualism and dreams and nightmares among college students. The 176 participants were divided into three groups, an early bilingual group (n = 100), a late bilingual group (n = 22), and a monolingual group (n = 54), all three groups with similarly diverse ethnic backgrounds. A set of six individual items assessing the language and qualities of dreams, and the Spadafora and Hunt scale (a measure for the frequency of experience of seven types of dreams) were embedded in the larger survey administered to the participants. Results revealed significant differences between the two bilingual groups in the language in which they experienced dreams and nightmares. The dreams of these two groups also differed significantly in the extent to which they reflected daily events. Plausible explanations for these findings are discussed.

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Differences in Dreams in a Bilingual College Population

Dreams have been regarded as important human experiences since ancient times. However, in the twentieth century, the popularization of dream research received a great impetus first, from the work of Sigmund Freud on dream interpretation (Hobson, 1998; Kane, 1994; Moffitt, Kramer & Hoffmann, 1993), and subsequently from the discovery of REM (Rapid Eye Movement) sleep (Koulack, 1993). It is perhaps the fact that nearly every person experiences dreams as well the great diversity of those dreams that positioned the study of dreaming in a privileged place in sleep research. According to Von Grunebaum and Callois (1966, as cited by Moffitt, et al., 1993), "the experience of dreaming and its recall vary within and among individuals across cultures along the following dimensions: frequency, quantity, quality, and type." (p. 2). This multifaceted attribute of dreaming has sparked substantial research in Psychology as well as other disciplines, for instance Biology, Anthropology, and Neurology to mention some (Koulack, 1993; Moffitt, et al., 1993).

Nevertheless, amidst the proliferation of research on dreaming in general, there has been almost a complete lack of interest in the study of dreaming among bilingual persons. This gap in the research on dreaming is in sharp contrast to the actual characteristics of this country's population. Specifically, statistics from the 1990 census revealed that 31.85 million people in this country speak a language other than English at home, and the Hispanic population is the ethnic group with the largest representation in these figures (over 17 million people) (Statistical Abstract of the United States, 1998). Although these statistics are not a direct or the most accurate estimate of the size of the

bilingual population, they certainly represent a conspicuous indication for the urgency to study people whose lives involve the use of two languages. In the following sections, some influential theories of dreaming and other relevant research conducted with monolingual persons are presented. The studies comparing different ethnic groups are of special interest at this point, for they provide most of the foundation for the research to be proposed herein.

Psychological Theories of Dreaming

Dreams and Stressful Events

Since the discovery of REM sleep (Aserinsky & Kleitman, 1953) and especially during the last ten years, psychological theories have been proposed to organize the accumulating knowledge of the functions of dreams. For example, based on evidence obtained with studies utilizing a wide array of pre-sleep stimuli, theorists have suggested that dreams influence the process of adaptation to stressful waking events (Koulack, 1993; Stewart & Koulack, 1993). The proposed accounts for explaining this relationship can be grouped into two apparently contrasting perspectives; namely, the mastery hypothesis and the compensatory/avoidance hypothesis. The first holds that dreams promote the adaptation to stressful events by activating habitual defensive patterns, or by giving the person an opportunity to integrate the new stressful material with solutions to previous similar problems (Stewart & Koulack, 1993). The second, in turn, suggests that dreams play a role in this process "...by avoiding references to currently stressful material in favor of elements or situations that augment or complement aspects of contemporary waking life." (Stewart & Koulack, 1993, p. 260). Although both

hypotheses have been supported throughout the years, neither has been capable of accommodating all the research findings. The disruption-avoidance-adaptation (DAA) model then, was proposed to conciliate the two perspectives by suggesting that both mastery and avoidance dreams play a role in the reduction of stress (Stewart & Koulack, 1993; Wright and Koulack, 1987). However, a test of the DAA model by Stewart and Koulack (1993) provided only partial support. Specifically, they analyzed the reports of 107 male college students over a period of seven nights; these contained assessments of pre-sleep and morning mood, dream pleasantness, and dream content. Participants were exposed either to a low-stress or a high-stress condition. Results revealed a variation in dream pleasantness as a function of stress, but there was no incorporation of the stressful treatment in dreams. Furthermore, mastery dreams were not observed the first night after the presentation of the stressful stimulus (one of the key assumptions of the model). Even though the DAA model was not completely supported, it truly merits further consideration because it represents a parsimonious attempt to reconcile the mastery and the avoidance hypothesis. The heuristic value of this research for the study of dreams with bilingual samples will also be invaluable since it would not be unlikely to find bilingualism and stress to be related.

Waking suggestions are another type of pre-sleep stimuli that has received attention in dream research in the last three decades. Among the influential frameworks proposed to explain the incorporation of these suggestions in subsequent dream content is the current-concerns theory; proposed nearly thirty years ago (i.e., Klinger, 1975). In this regard, Nikles II, Brecht, Klinger, and Bursell (1998) stated that:

> "...becoming committed to any goal potentiates emotional responses to and cognitive processing of cues associated with that goal pursuit...depending on the ability of the stimulus to satisfy certain criteria, cognitive processing is terminated or carried forward, potentially to the point of conscious thought or dreaming." (p. 242).

In their investigation, this group of researchers used laboratory REM-dreams reports to analyze the content of dreams of ten college students. Their results demonstrated that suggestions related to current-concerns influenced dream content (particularly the central imagery) more than nonconcern-related suggestions. They concluded that volitional processes remain sufficiently active during sleep to alter dream imagery.

In another study dealing with current concerns, Saredi, Baylor, Meier, and Strauch (1997) investigated the occurrence of waking concerns in the REM dreams of eight male participants. Dream reports were collected with dream awakenings during three nights in the laboratory. The main focus of the study was to examine if the incubation of a current concern prior to sleep would enhance the incorporation of that concern in subsequent REM dreams. The definition of current concerns utilized for this research was the same definition described in the previous study. Different from prior research though, in this study the participants created a list of their own current concerns for ten categories (e.g., family/ home and education). The results of this study showed that incubation of the current concern was not reliably effective in producing the incorporation of that material in subsequent dreams. However, in the nights in which the

participants experienced the incubation of the current concern, a greater variety of categories from the concerns included was observed.

Although the studies previously described do not provide unequivocal evidence of the connection between waking events and dreams, this body of research conducted with monolingual persons should still be contemplated very carefully in the study of dreaming with bilingual persons. It is plausible that the use of two languages could very well result in these events playing a more influential role in experienced dreams.

Content of Dreams

Regarding the content of dreams, it is necessary to stress that the content of dreams is closely intertwined with the degree of meaning and functionality ascribed to them, one of the most controversial issues in the study of dreams. Theories are usually classified based on the level of meaning they attribute to dreams (Moffitt et al., 1993). On the optimistic extreme of the continuum, there are theories like Freud's psychoanalytic theory of dreams, which embrace the position that all the elements in a dream are valuable or meaningful (Hobson, 1998). And, in psychoanalysis most of this meaning is extracted from the symbolic content of dreams (Kane, 1994, Moffitt et al., 1993).

For theorists in the middle of the continuum, some dreams or even parts of a dream are meaningful experiences while others are not (Hobson, 1998; Moffitt, et al. 1993). In this regard, Hobson (1998) stated recently that the importance resides in the separation of the "meaningful" dream elements from the "nonsensical" ones. Finally, for the theorists at the meaningless end of the continuum, dreams are experiences void of any meaning or function. For instance, the theory advanced by Crick and Mitchison (1983),

referred to as a neural net theory, is an example of an afunctional theory. In this view, dreaming is seen as a process by which the brain disposes of error or noise, and above all, dreams are considered completely meaningless. However, some researchers question the validity of this classification. For instance, Purcell, Moffitt and Hoffmann (1993) support the notion that even if dreams' only function is to eliminate noise, then it is not correct to classify this theory as an afunctional theory.

The functional aspects of dreaming and its unique characteristics have been recently addressed by Hobson (1998) and States (1998); they hold different views regarding the functions and the basic mechanisms of dreaming. Hobson in his research utilizes a neurophysiological approach to the study of REM sleep dreaming. He recently proposed a model in which dreams and delirium are analogous processes. According to Hobson, this type of dreaming "evinces all four of the cardinal defining features of delirium: visual hallucinosis; disorientation; memory loss, and confabulation." (p. 212), and these in turn are caused by the "cholinergic neuromodulation dominance in REM sleep)" (p. 213). Furthermore, Hobson considers both dreaming and delirium natural processes with functional as well as disfunctional or "nonsensical elements", and he criticized States for supporting the simplistic view that in dreams the "only operative algorithm is associativity" (p. 216).

States (1998), on the other hand, has studied dreaming from an analogical perspective, and contrary to Hobson's approach, he considers dreaming as a process involving more than a recollection of dream events. Specifically, he considers the dreamer's involvement in the dream events as crucial for determining the coherence of

that dream. In his discussion, he also clarified for Hobson the fact that he does consider the occurrence of discontinuity in the dream state as much as in methaphoric thinking. Finally, he stated that some aspects of dreaming, such as the differences in the level of disorientation of dreams simply cannot be explained only by the physiological explanation proposed by Hobson.

Research on Ethnicity

Contrary to the Freudian emphasis on latent content of dreams, some research has compared the manifest dream content of participants from different cultural backgrounds (e.g., Kane, 1994). Kane suggested that this content may reflect a person's "everyday experiences and current concerns" (p. 203). The purpose of her study was to compare several elements in the manifest dream content of Anglo-American, Mexican-American, and African-American college women. The results showed that compared to Anglo- and Mexican-American women, African-American women scored significantly higher on the "environmental press" element, described as "good fortune or misfortune that is beyond the dreamer's control" (p. 205).

Having a cultural emphasis and crucial implications in counseling settings, Kane (1994) classified the participants only on their cultural background and number of family generations living in this country. As a result, despite the latent possibility of having bilingual participants in the sample, language-related aspects of their dreams were not investigated. The importance of studying ethnicity, however, should not be overlooked. In the next paragraphs, a series of studies investigating the relationship between ethnicity and several variables will be presented.

Recently, members of the sleep research laboratory at San Jose State University conducted a series of studies dealing with ethnicity and its relationship to several variables, including dreams and other sleep variables. Among the most relevant for the research to be presented in this document, is the analysis of dream data assessed also with the Spadafora and Hunt scale, and conducted by Lucero-Gorman (1997). The 1100 participants in this study represented four ethnic groups (African-American, Asian, Caucasian, and Hispanic). The results showed that Asians and males reported significantly the most Archetypal Dreams, and African-Americans and females reported the most night terrors. Other main effects for gender revealed that females were significantly more likely to report Fantastic Nightmares, Post Traumatic Nightmares, and Prelucid Dreams than men.

Hicks, Lucero-Gorman, and Bautista (1999) also observed a moderate relationship between ethnicity and sleep duration and sleep satisfaction. In this study, Hicks and his colleagues inquired the number of sleep hours and the satisfaction with that sleep of 1100 college students. The four ethnic groups represented were: African-American, Asian, Caucasian, and Hispanic. Results revealed that Asians reported sleeping significantly fewer hours than Caucasians and Hispanics. Significant differences were also observed between the number of students reporting being satisfied with their sleep and those not satisfied.

Finally, further analyses of the same groups showed that even though it was not as strong a predictor as was sex, ethnicity also played a role in the incidence of snoring reported by college students (Hicks, Lucero-Gorman, & Ching, 1997).

Bilingualism and Dreams

Research conducted with monolingual persons has also demonstrated that language and dreams may be related. For instance, Foulkes, Meier, Strauch, Kerr, Bradley, and Hollifield (1993) cited research reporting that an overwhelming majority (86 to 100%) of "medium" to "long" REM dream reports contain speech. According to their study, Heynick (1983) showed that speech observed in dreams is "both grammatically well-formed and contextually appropriate." (p. 872). The prevalent occurrence of speech in REM-type dreams, then, emphasizes the connection between language and dreams.

The study of the relationship between language and dreams with bilingual persons will supplement the findings obtained to date with neurological approaches and language processing in waking states. In a representative study in this area, Periani, et al. (1998) studied two groups of high-proficiency bilingual participants with PET scans. The first group included 9 males who were Italian-English bilinguals and acquired the second language after age 10, and the second group included 12 Spanish-Catalan male bilinguals, who acquired the second language before age 4. The regional Cerebral Blood Flow was recorded while the participants listened to stories in their first language, a second language, and in an unknown language or backward speech. Results showed that contrary to a low-proficiency group of bilingual participants in a previous study (Periani, et al., 1996), the high-proficiency participants had similar areas of the brain activated by stories in both their first and second language. Furthermore, the lack of differences in the cortical responses of early and late bilinguals suggests that proficiency with the second language

plays a more important role than the age of acquisition. Finally, as the authors point out, the biggest challenge with neuropsychological research resides in connecting their findings with the findings obtained with behavioral research.

With regard to the specific study of dreams with bilingual persons, there seems to be a tremendous scarcity of research. In fact, to my knowledge there is only one study in the literature that has considered the dreams of bilingual people. In this study, Foulkes, Meier, Strauch, Kerr, Bradley and Hollifield (1993) analyzed the relationship between certain linguistic phenomena and REM dreams among German-English bilinguals. Eight of the participants were native English speakers living in Zurich (Germany), and the other eight were native German speakers living in Atlanta (U.S.). On a seven-point scale, all of them rated their proficiency with their second language either a 6 or 7. Participants spent four nonconsecutive nights in a sleep laboratory; in two of these nights only German was spoken, and in the other two only English was spoken. After changing their clothes and having the electrodes attached, participants provided pre-sleep thought samples. Following sleep onset, dream reports were collected from the first four REM periods. Finally, before leaving the laboratory, researchers interviewed the participants to assess the language appropriateness for the pre-sleep thoughts and dream awakenings. They found no evidence to support the view that bilingualism obstructs "dreaming itself nor the appearance of well-formed, contextually appropriate language phenomena within dreams..." (p. 889). Instead, these authors interpreted the evidence as suggestive of high-level processing systems for different languages being amply shared rather than separate systems.

These researchers also found that the language employed in the pre-sleep session (systematically varied) predicted the language of linguistic representation (i.e., speaking) and thinking employed during thought samples and REM-dreams reports. More specifically, in nights in which the session was conducted in German, there was significantly more German linguistic representation in REM reports and thought samples in which both self and others spoke German; for bilinguals in Atlanta, sessions in English were significantly associated with more English representations in dreams only. This influence, in turn, was more accentuated when the speech representation corresponded with the state (e.g., thinking in thought samples and overt speech in REM dreams). That is, if the thought samples were conducted in English, there was significantly more thinking in English on that night than on German sessions.

Objectives of this Research

In an attempt to expand on the limited existing knowledge about the dreams of bilingual people, this study was proposed to explore the dreams of bilingual college students. A particularly important goal in this investigation was to determine the relationship between the age of acquisition of the second language (i.e., English) and the person's dreams. Students were therefore, classified as early and late bilinguals. Although differences between the two groups were expected, because of the lack of any previous literature no predictive hypotheses were advanced. However, this study was designed to overcome a limitation in the existing study. That is, the bilingual participants represented an array of diverse ethnic backgrounds, and hence more languages were also considered. Second, the division of participants into two groups based on their age of acquisition of

the English language provided for a rough assessment of the connection between the amount of experience with bilingualism and dreaming.

Method

Participants

The participants of this study were selected from the archival data set of a survey study assessing student's knowledge of sleep, dreams, and health-related behaviors. The sample was comprised of college students from introductory Psychology courses, and they received course credit for their participation. One hundred and twenty two bilingual, male (n = 53) and female (n = 69), participants were selected from a sample of over 400 students taking part in the larger study. In this study, participants were considered bilingual if they reported a native language other than English, and if they engaged in daily activities (e.g., thinking and speaking) in both languages at the time the study was conducted (see Appendix A). The mean age of the bilingual participants was 19.26 years (19.38 and 19.09 years for females and males, respectively). In order to attain the most crucial goal of this study; i.e., to assess differences between students with distinct levels of experience with the English language, the bilingual group was divided into two groups, an early group, with one hundred participants that learned English before age 10 (58 females and 42 males), and a late group, with 22 participants that learned English at age 10 or later (11 females and 11 males). Finally, as a means of providing a more complete sample, a third group comprised of 54 English monolingual participants, 34 females and 20 males, also with diverse ethnic backgrounds was selected from the same data set. These students reported English as their native language, and as the only

language for the questions presented in Appendix A. The mean age for this group was 18.68 years (18.41 years for females and 18.95 years for males).

The ethnic background and gender of the participants is presented in Appendix B. For both genders, the majority of students in the "other" ethnic category reported being from India or countries in the Middle East. The different ethnic groups are not equally represented in the sample; however, this group of participants is highly representative of the student population at San Jose State University.

The mean number of years speaking English for the early group and the late group were $\underline{M} = 14.94$, $\underline{SD} = 2.99$ and $\underline{M} = 7.44$, $\underline{SD} = 2.84$, respectively. The ages of the three groups were as follows: $\underline{M} = 20.95$, $\underline{SD} = 3.82$; $\underline{M} = 18.89$, $\underline{SD} = 1.78$; and $\underline{M} = 18.61$, $\underline{SD} = .94$ for the late bilingual group, the early bilingual group and the monolingual group, respectively. As is noted, the late group was approximately two years older than the early group. However, this difference is probably a reflection of the tremendous challenge inherent in the acquisition of a new language while, at the same time, meeting the requirements of a new education system. The fact that the late group is considerably smaller than the early group also seems to support this explanation, for not every student facing the academic difficulties encountered by late bilinguals is able to overcome them.

Measures of Dreams

The measurement of dreams was achieved using both a set of individual items and a scale that measures types of dreams.

Individual Items: The analyses of participants' dreams was conducted with the following survey items: 1) On an average, how many dreams do you have each night? 2)

Language used in dreams, 3) Language used when having nightmares, 4) My dreams typically reflect daily events 5) My dreams are valuable experiences, 6) I experience pain while I'm dreaming (presented in Appendix C). The response format for the first three items was open-ended. Responses to item 4 were on a five-point scale [never (or almost never), seldom, occasionally, frequently, always or (almost always)]. Scores ranged from one (never experiencing dreams reflecting daily events) to 5 (always experiencing dreams reflecting daily events). Items 5 and 6 used the following six-choice response format: Never (or almost never), rarely, sometimes, often, usually, and always (or almost always); these scores ranged from one (never experiencing valuable dreams or pain while dreaming) to six (always experiencing valuable dreams or pain while dreaming).

Assessment of Dream Types: The Spadafora and Hunt Dream Types Survey (1990) was utilized to assess different types of dreams. This scale measures how frequently the respondent experiences each of the following seven types of dreams: archetypal dreams, lucid dreams, fantastic nightmares, prelucid dreams, control dreams, post-traumatic nightmares, and night terrors (see Appendix D for detailed descriptions). The consistency of the results obtained with this scale and those of previous research attest to the reliability of the dream descriptions utilized in this scale. The response format uses a 5-point scale [i.e., never (or almost never), seldom, occasionally, frequently, always or (almost always)], and the items are analyzed individually. These scores range from one (never experiencing that type of dream) to five (always experiencing that type of dream).

Procedure

Students participating in the survey were contacted in a class meeting. Research assistants presented the questionnaire and the consent form to the students; they also stated the amount of credit units granted for their participation. Surveys were then distributed to the persons who chose to participate, and were collected at the end of the class meeting.

As previously described, the data included in this study were those provided by participants classified as bilingual and their monolingual counterparts. The language used by the person during daily activities such as thinking and speaking was used for the purpose of classifying the participants. All data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS, version 8.0).

Results and Discussion

The means and standard deviations for each item that used a Likert-type response measure are listed in Table 1, and the gender-specific data for the same items is presented in Appendix E. Individual contingency tables are used to organize the data for each of the other items.

The results for each individual item as well as the dream types scale items will be described and discussed in the following sections. Furthermore, for the six individual items, point-biserial correlation coefficients were also calculated. These analyses included only the two bilingual groups and the same response categories utilized for the chi-squares analyses. These correlation coefficients are presented in Appendix F.

Table 1

Means and Standard Deviations for Each Group for Each of the Individual and Dream-Types Items

	Groups					
	Early Bilinguals (N = 100)		Late Bilinguals (N = 22)		Monolinguals (N = 54)	
Items	M	SD	M	SD	M	SD
Individual Items						
1. Number of Dreams	1.73	± .97	1.45	± 1.06	1.85	± 1.22
4. Dreams reflect daily life	2.80	± 1.07	2.32	± .89	2.52	± .99
5. Dreams are valuable	2.92	± 1.00	2.76	± 1.26	3.04	± 1.05
6. Pain while dreaming	1.69	± .78	1.48	± .68	1.71	± .94
Dream Types						
Archetypal Dreams	1.87	± .86	2.18	± .85	2.06	± .98
Lucid Dreams	2.36	± 1.01	2.55	± 1.06	2.20	± .98
Fantastic Nightmares	2.39	± 1.11	2.23	± .75	2.30	± .98
Prelucid Dreams	2.31	± 1.07	2.14	± 1.08	2.31	± .97
Control Dreams	2.30	± 1.07	1.91	± 1.06	2.06	± 1.02
Post-Traumatic Nightmares	1.66	± .91	1.50	± .80	1.48	± .61
Night Terrors	1.61	± .93	1.67	± 1.06	1.44	± .63

Note. High scores for the individual items indicate more dreams or more agreement with the specific item. Low mean scores reflect less experiencing of the type of dream.

Average Number of Dreams: The means and standard deviations for this item for each of the three groups are summarized in Table 1. First, these data were tested by computing a one-way analysis of variance; the result of this test was not significant, $F(2, 167) = 1.03$, $p > .05$. However, by inspection, the data appeared to be skewed and further nonparametric analyses were conducted for these data. To do this, the contingency table presented in Table 2 was formed and analyzed by computing a Chi square statistic. The result of this analysis approached significance $\chi^2 (2, N = 168) = 5.48$; $.05 < p < .10$. These data suggest that late bilinguals report fewer dreams. Finally, as Lucero-Gorman (1997) had reported in an earlier study, these data indicated that women are about two times more likely to report dreams than men, regardless of their bilingual status.

Dream Language: The data for the dream language items (i.e., items 2 and 3) were organized into these categories: dreams in English, dreams in the native language, and dreams in a combination of English and the native language. (The monolingual participants were excluded in these analyses because all of them reported experiencing dreams and nightmares in English only). These data for the two bilingual groups were first organized into the contingency tables presented in Table 3.

By inspecting Table 3, it is clear that the languages used by early and late bilinguals differ, and this is especially true for nightmares. With regard to dreams, early bilinguals were 2.25 times more likely to report that they dream in English than late bilinguals. Late bilinguals, on the other hand, were 2.22 times more likely to dream in their native language and 2.98 times more likely to dream in both of the languages than

Table 2

Participants in Each Number of Dreams Category for Each Group by Gender

Group	Zero or One Dream	More than one dream
Early Bilinguals		
Males	21 (51.2 %)	20 (48.8 %)
Females	22 (40.7 %)	32 (59.3 %)
Late Bilinguals		
Males	9 (81.8 %)	2 (18.2 %)
Females	5 (50 %)	5 (50 %)
Monolinguals		
Males	8 (40 %)	12 (60 %)
Famales	11 (34.4 %)	21 (65.6 %)

Note. Not all the participants provided responses for this question.

Table 3

Dream and Nightmare Language for Early and Late Bilinguals

	Group	
	Early Bilinguals (N = 76)	Late Bilinguals (N = 19)
Dream Language		
English	54 (71.0 %)	6 (31.6 %)
Native Language	18 (23.7 %)	10 (52.6 %)
Both Languages	4 (5.3 %)	3 (15.8 %)
Nightmare Language		
English	57 (75.0 %)	7 (36.8 %)
Native Language	5 (6.6 %)	8 (42.1 %)
Both Languages	14 (18.4 %)	4 (21.0 %)

Note. Not all participants provided answers for these two items.

their early bilingual peers [χ^2 (1, $\underline{N}$ = 95) = 10.36; $\underline{p}$ < .01; ϕ^2 = .11]. For nightmare experiences, early bilinguals were 2.04 times more likely to report nightmares in English than was the case for late bilinguals. Conversely, late bilinguals were 6.38 times more likely to experience nightmares in their native language than the early bilinguals [χ^2 (1, $\underline{N}$ = 95) = 17.36; $\underline{p}$ < .001; ϕ^2 = .18].

Dreams and Daily Events: For item 4 (dreams reflecting daily events), the responses were grouped into high-frequency choices (i.e., often, frequently, and always) and low-frequency choices (i.e., never or seldom). These data were then used to form the contingency table that is included in Table 4. The responses of the three groups differed significantly [χ^2 (2, $\underline{N}$ = 176) = 7.27; $\underline{p}$ < .05; ϕ^2 = .04], as did the choices endorsed by the two bilingual groups [χ^2 (1, $\underline{N}$ = 122) = 6.69; $\underline{p}$ < .01; ϕ^2 = .05]. As shown in Table 4, the early group selected choices in the high frequency category nearly twice as many times as the late group. In complement, for the responses falling in the low frequency category, the groups displayed almost the opposite pattern. Monolingual participants in turn, endorsed the two frequencies in equal proportions.

By inspection, the over all analysis is misleading. The real difference is observed between the two bilingual groups. Again, early bilinguals are about two times more likely to feel that their dreams reflect daily events than their late bilingual counterparts.

Value of Dreams: The answers for the item assessing the value attributed to dream experiences (Item 5) were analyzed by assigning responses to one of three categories: Low value (i.e., never and rarely), median value (i.e., sometimes and often),

Table 4

Responses of Each Group for the Item "My Dreams Reflect Daily Events"

	Frequency of Experience	
Group	Low	High
Early Bilinguals		
(N = 100)	38 (38.0%)	62 (62.0%)
Late Bilinguals		
(N = 22)	15 (68.2%)	7 (31.8%)
Monolinguals		
(N = 54)	27 (50 %)	27 (50 %)

and high value (i.e., usually and always). The resulting contingency table that was formed using these three categories is presented in Table 5.

The difference in the responses of the three groups were not statistically significant [χ^2 (2, N = 168) = 3.29]. A comparison of early and late bilinguals was also not significant, χ^2 (1, N = 120) = 2.41. Thus, these groups seem to value their dreams at about the same overall level.

Pain in Dreams: Regarding the experiencing of pain in dreams, the choices "often" and "always" were selected only once. Therefore, the answers were analyzed in only two categories: low frequency (i.e., never and rarely) and high frequency (i.e., sometimes, often, and always). The contingency table formed by using these categories is given in Table 6. The differences between these three groups was not significant [χ^2 (2, N = 168) = .82]. The difference between the two bilingual groups was also not significant [χ^2 (1, N = 120) = .76].

Dream Types: The means and standard deviations for the seven types of dreams for the three groups in the Spadafora and Hunt scale are presented in Table 7. Analyses of variance 3 x 2 (groups x genders) were conducted with the data for each type of dream. However, since no consistent gender differences were observed for the three groups, the data for males and females in each group were combined (for data specific to each gender see Appendix E). An alpha level of .05 was utilized for all these tests.

As can be observed in Table 7, the data provided by the three groups for each type of dream were not statistically different. Only the data obtained for the Archetypal Dreams approached significance (p = .062).

Table 5

Responses of Each Group for the Item "My Dreams are Valuable Experiences"

	Value of Dreams		
Group	Low	Median	High
Early Bilinguals			
(N = 99)	34 (34.3%)	56 (56.6%)	9 (9.1%)
Late Bilinguals			
(N = 21)	10 (47.6%)	8 (38.1%)	3 (14.3%)
Monolinguals			
(N = 48)	14 (29.17 %)	29 (60.42 %)	5(10.42 %)

Table 6

Responses of Each Group to the Item "I Experience Pain While Dreaming"

	Frequency	
Group	Low	High
Early Bilinguals		
(N = 99)	82 (82.8%)	17 (17.2%)
Late Bilinguals		
(N = 21)	19 (90.5%)	2 (9.5%)
Monolinguals		
(N = 48)	41 (85.42 %)	7 (14.58 %)

Table 7

Means and Standard Deviations for Dream Types and for Each Group

	Groups						
	Early Bilinguals (n = 100)		Late Bilinguals (n = 22)		Monolinguals (n = 54)		
Dream Type	M	SD	M	SD	M	SD	F
Archetypal Dreams	1.87	± .86	2.18	± .85	2.06	± .98	2.83
Lucid Dreams	2.36	± 1.01	2.55	± 1.06	2.20	± .98	.694
Fantastic Nightmares	2.39	± 1.11	2.23	± .75	2.30	± .98	.19
Prelucid Dreams	2.31	± 1.07	2.14	± 1.08	2.31	± .97	.34
Control Dreams	2.30	± 1.07	1.91	± 1.06	2.06	± 1.02	1.56
Post-Traumatic Nightmares	1.66	± .91	1.50	± .80	1.48	± .61	.77
Night Terrors	1.61	± .93	1.67	± 1.06	1.44	± .63	.73

Note. Low mean scores reflect less experiencing of the type of dream.

Conclusions

Research dealing with the dreams of bilingual people is still in its most basic stage of development, and though the study conducted by Foulkes and colleagues (1993) is an admirable effort in changing the current situation, a colossal amount of work remains to be done. This study presented analyses of several dream characteristics as well as dream types reported by bilingual participants; these analyses were further enhanced by the consideration of data of a monolingual group with ethnic backgrounds as diverse as those of the bilingual groups. Collectively, the results of this study suggest that language is related to the dreams experienced by a person, and for the bilingual participants this relationship seems to vary according to the age of acquisition of the second language.

The data that most clearly revealed differences between the two bilingual groups were those dealing with the language utilized during dreams. These results showed that for both dreams and nightmares, early bilinguals utilized the English language roughly twice as often as late bilinguals. Furthermore, a considerable number of early bilinguals reported utilizing both languages in their nightmares; as a matter of fact, this category was three times larger than the one observed for dreams in general. An unequivocal interpretation of these results is not possible. Numerous possibilities could account for the observed results. For instance, the inclusion of both languages in dreams could reflect an attempt to extract the meaning of nightmares in a more effective manner, or it could also be that the combination of the two languages contributes to the negative characteristics of the nightmare itself. Further research would be necessary to select

between the different explanations; nevertheless, the differential influence of language in dreams and nightmares has, to my knowledge, not been reported in the existing literature.

Results also showed differences between participants in the Early and the Late groups regarding how often their dreams reflect daily events. In fact, students in the early group were twice as likely to endorse choices of high frequency than students in the late group. A plausible explanation for this finding could be that early bilinguals are more integrated to this society, and hence involved in more and also more varied activities than late bilinguals. A higher level of activity could very well result in a more absorbed and stressful life-style for early bilinguals, compared to late bilinguals. Support for this interpretation are the findings of previous research which have provided evidence on the existence of an association between waking experiences and characteristics of dreams (Foulkes, et al., 1993; Nikles et al., 1998; Stewart & Koulack, 1993).

Regarding the value attributed to dreams and the experiencing of pain during dreams, no significant differences were observed between the three groups. However, they should be considered in future investigations with larger samples. Finally, the data for the dream types assessed by the Spadafora and Hunt scale showed that the groups did not differ significantly on any of the dream types.

In future research, it would be advantageous to replicate our findings, since these differences can begin to elucidate what factors affect the characteristics of dreams, especially of people with different levels of experience of the English language. Finally, future research should attempt to sample similar proportions of different ethnic groups; in our study Asians were over-represented. However, as was previously mentioned, the

proportions in our sample are very representative of the student population at San Jose State University.

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Appendix A

These questions are designed to measure certain relationships between how people sleep and dream and their ethnic or cultural background. Please answer each question as best you can.

1. My ethnic or racial origin is:

   African-American____American Indian____Asian____Caucasian____

   Mexican-American____other Hispanic____Other (describe)____

2. My native language is_____

3. If English is your second language, how many years have you spoken

   English?_____years.

4. If English is your second language, please indicate the language that you use when you engage in the following mental activities:

   When I dream.....____

   When I have a nightmare.....____

   When I think about things.....____

   When I do math problems in my head.....____

   When I am thinking about a stressful situation.....____

5. What language do you speak at home? .....____

6. What Language do you speak with your friends? .....____

Appendix B

Ethnic Background of Participants

	Groups					
	Early Bilinguals		Late Bilinguals		Monolinguals	
Ethnic Group	Males	Females	Males	Females	Males	Females
African American	--	2 (2 %)	--	--	--	2 (3.7%)
American Indian	--	1 (1%)	--	--	--	--
Asian	26 (26%)	25 (25%)	9 (40.9%)	8 (36.4%)	8 (14.8%)	14 (25.9%)
Caucasian	--	2 (2%)	--	1 (4.6%)	1 (1.9%)	3 (5.6%)
Mexican American	9 (9%)	14 (14%)	--	1 (4.6%)	2 (3.7%)	8 (14.8%)
Other Hispanic	1 (1%)	4 (4%)	1 (4.6%)	1 (4.6%)	--	1 (1.9%)
Pacific Islander	3 (3%)	4 (4%)	--	--	4 (7.4%)	5 (9.3%)
Other[a]	3 (3%)	6 (6%)	1 (4.6%)	--	5 (9.3%)	1 (1.9%)

[a]This category contains the students who provided their own ethnic background.

Appendix C

1. If English is your second language, please indicate the language that you use when you engage in the following mental activities:

   When I dream....._____

   When I have a nightmare....._____

2. On average, how many dreams do you have each night?_____

3. My dreams are valuable experiences...

   Never___Rarely___Sometimes___Often___Usually___Always___

4. I experience pain while I'm dreaming...

   Never___Rarely___Sometimes___Often___Usually___Always___

5. My dreams typically reflect daily events.

   Never___Rarely___Sometimes___Often___Usually___Always___

Appendix D

Please read the definitions provided for each dream type and identify the frequency with which you experience each type.

Scale: A. Always (or almost always)
B. Frequently
C. Occasionally
D. Seldom
E. Never (or almost never)

_____LUCID DREAMS (vivid dreams in which you realize that you are dreaming while your are still in the dream).

_____ARCHETYPAL DREAMS (dreams that carry a sense of awe and fascination and/or include encounters with strange and unusual beings - perhaps reminiscent of mythology and fairy tales).

_____FANTASTIC NIGHTMARES (very vivid, upsetting dreams that you remember in detail upon awakening and can involve a wide range of negative emotions).

_____PRELUCID DREAMS (where one questions whether one id dreaming, but cannot decide).

_____CONTROL DREAMS (where control not possible in waking life is deliberately exercised in the dream, with or without lucid awareness of dreaming).

_____POST TRAUMATIC NIGHTMARES (dreams repeating an actual past trauma).

_____NIGHT TERRORS (terrifying awakenings without any recall of dream content).

Appendix E

Means and Standard Deviations, for Dream Types and for Each Group and Gender

Group	n	Dream Type: Archetypal Dreams M ± SD	Lucid Dreams M ± SD	Fantastic Nightmares M ± SD	Prelucid Dreams M ± SD
Early	Males (n = 48)	1.74 ± .77	2.14 ± .90	2.26 ± 1.08	2.31 ± 1.02
Bilinguals	Females (n = 52)	1.97 ± .92	2.52 ± 1.06	2.48 ± 1.13	2.31 ± 1.11
N = 100	Total	1.87 ± .86	2.36 ± 1.01	2.39 ± 1.11	2.31 ± 1.07
Late	Males (n = 11)	2.36 ± 1.03	2.45 ± 1.04	2.36 ± .67	2.18 ± 1.08
Bilinguals	Females (n = 11)	2.00 ± .63	2.64 ± 1.01	2.09 ± .83	2.09 ± 1.14
N = 22	Total	2.18 ± .85	2.55 ± 1.06	2.23 ± .75	2.14 ± 1.08
	Males (n = 20)	2.60 ± 1.05	2.40 ± .88	2.40 ± 1.23	2.50 ± 1.10
Monolinguals	Females (n =34)	1.74 ± .79	2.09 ± 1.03	2.24 ± .82	2.21 ± .88
N = 54	Total	2.06 ± .98	2.20 ± .98	2.30 ± .98	2.31 ± .97
Overall F value		2.83	.69	.19	.34

Note. Low mean scores reflect less experiencing of the type of dream. [a]n = 57. [b]n = 10.

(table continues)

Group	n	Dream Type: Control Dreams M ± SD	Post-Traumatic Nightmares M ± SD	Night Terrors M ± SD
Early	Males (n = 48)	2.26 ± .96	1.57 ± .83	1.43 ± .63
Bilinguals	Females (n = 52)	2.33 ± 1.15	1.72 ± .97	1.74 ± 1.09
N = 100	Total	2.30[a] ± 1.07	1.66 ± .91	1.61 ± .93
Late	Males (n = 11)	2.18 ± 1.33	1.36 ± .50	1.55 ± .82
Bilinguals	Females (n = 11)	1.64 ± .67	1.64 ± 1.03	1.80 ± 1.32
N = 22	Total	1.91 ± 1.06	1.50 ± .80	1.67[b] ± 1.06
	Males (n = 20)	2.15 ± 1.04	1.50 ± .61	1.40 ± .60
Monolinguals	Females (n =34)	2.00 ± 1.02	1.47 ± .61	1.47 ± .66
N = 54	Total	2.06 ± 1.02	1.48 ± .61	1.44 ± .63
Overall F value		1.56	.77	.73

Note. Low mean scores reflect less experiencing of the type of dream. [a]n = 57. [b]n = 10.

Appendix F

The point-biserial correlation coefficients, which is a particular type of Pearson product-moment correlation was calculated with one nominal variable (i.e., early and late bilinguals) and an interval variable (i.e., the response categories). An advantage in calculating the point-biserial correlation coefficient is the effortless derivation of the coefficient of determination (r^2_{pb}), which reveals the amount of variability observed in the interval variable (i.e., response categories) explained by the nominal variable (i.e., group membership). Not surprisingly, only the three items in which the early and late groups had differed significantly from each other with the chi-square analyses (i.e., "language used in dreams", "language used when having nightmares", and "my dreams typically reflect daily events") produced significant correlations.

The strongest correlation between group membership and the responses endorsed by the participants was observed for the dream language item [r_{pb} (90) = .27, $p < .01$; r^2_{pb} = .03]. The three categories utilized for this item were English language, native language, and combination of English and native language.

The analysis of the nightmare language also yielded a significant correlation between the grouping variable and the response variable r_{pb} (90) = .25, $p < .05$; r^2_{pb} = .06. The response categories used for this item were the same of the previous item.

Finally, the lowest significant point-biserial correlation was obtained for the item "my dreams typically reflect daily events" [r_{pb} (114) = .17, $p < .05$; r^2_{pb} = .03], which was analyzed with two response categories (low frequency and high frequency of experience).